1. CALL TO ORDER & OPENING REMARKS - Ed Hall, CTIA, Co-chair

Forum was called to order by co-chair, Ed Hall, on behalf of himself and Mary Madigan, co-chair. In a call to review the contents of the TTY Forum Report, the co-chair stated that the report provides extensive documentation of the activities at the TTY/TDD Forum-1. The group must review topics and ensure that all issues can be discussed that are of significance to the forum. Refer to the goal: Seeking solutions to TTY/TDD through Wireless Digital Systems. Address request for adjustment of the agenda order of topics. Suggestion offered to move up agenda topics 9, 10, and 1st bullet of 12 because they represent the point where the last meeting left off and then move on to new activities. Agreed. Also agreed to move to agenda item 3 then move on to subsequent topics. Ericsson requested a demonstration be added to the agenda showing results of various tests with acoustic coupling and direct coupling. Demo placed between agenda items 11 & 12. Norm Williams will provide a demo of the direct coupling tests performed at Gallaudet at the same time.

Call for contributions. None offered.

The chair offered a numbering plan for contributions to afford good record keeping. Numbering sequence will be: TTY/97.12.11__ __. The Agenda will be numbered TTY/97.12.11 01, etc. - all contributions in package to be labeled in this form. The group can refer to agenda topics and the contributions and/or documentation related. Agreed.

2. INTRODUCTION & ATTENDANCE ROSTER

Steering Committee was introduced:

Jeff Crollick - Chair TIA, TR45.2
Toni Dunn - TX 9-1-1 Commission
Ed Hall - CTIA
Mary Madigan - PCIA (absent)
John Melcher - Harris County 9-1-1
Billy Ragsdale - Chair NENA CPE committee, Bell South
Claude Stout - Telecommunications for the Deaf, Inc.
Norm Williams - Gallaudet University

Attendance roster circulated.

3. REVIEW & APPROVE FORUM-1 MEETING SUMMARY - Ed Hall, CTIA

MEETING SUMMARY FROM FORUM-1:
Requests for modifications and clarifications. None. Moved to accept as stands, seconded and accepted.

9. REVIEW AGREEMENTS REACHED AT TTY FORUM - 1

- "Solve for 45.45 Baudot, not to preclude looking for other solutions."
- Also agreed to look for long term and near term solutions.
  - <u>Near term</u> - send through vocoder
  - <u>Long term</u> - circumvent vocoder, enhance quality and connectivity
- Also agreed to provide for the analog function of wireless phones - statement from Forum-1 regarding this was read. No dissent.
- The only body that can change the agreements reached is this body. All agreements remain intact until/unless action is taken in this forum.

10. REVIEW STATEMENTS FROM TTY-1 FORUM

Statement 1 - *Most E9-1-1 trials have focused on AMPS and MF signaling, we seem to be behind with respect to digital technologies and ISUP signaling solutions.*
Comment: Testing on AMPS only

Statement 2 - *There does not seem to exist a mechanism to coordinate and integrate requirements on wireless service providers or wireline 9-1-1 tandem and PSAP terminals/capabilities. Workshops such as this are doing an outstanding service/contribution to a common understanding and teamwork, but this does not replace the need for implementation coordination.*
No comments.

Statement 3 - *Even a 1% character error rate is unacceptable due to the fact that a deaf person in an emergency situation will be upset and mistype themselves and then add to the 1% error rate via transmission wireless resulting in misinterpretation on the part of the calltakers at 9-1-1 centers.*
Comment: We have seen error rate on wireline, and wireless will have error rate. Could we get away from hard numbers when talking about error rate? We need to review statement #3 for discussion.
Comment: After Agenda topic 12 we will use this statement as a discussion topic.

Action taken at Forum - 1: Request to the FCC asking for an extension of 18 months. Statement read with no discussion.

Issues:

Issue 1 -*Support for VCO/HCO in digital*
- *VOCODER*
- *MODEM*
- *Echo Cancelor*

No comment

Issue 2 - *What is an acceptable performance/error rate? Compared to what...?*
- *Voice call in similar environment*
- *Need for Certification Process*

Comment: Add error rate on wireline as a comparison

Issue 3 - *Physical connection options (TTY to MS)*
- *Acoustic*
- *Audio-direct (RJ-11/2.5mm)*
- *Digital-direct*

No comment

Issue 4 - *Project timeline*
No comment

Issue 5 - *Follow-on standards work*
- *TI*
- *TR45*

No comment

Issue 6 - *Are TTY companies willing to retrofit products?*
No comment

Issue 7 - *Future effort - monitor the development of Section 255.*
Comment: add "of Telecom act of 1996"

11. ADDRESS UNANSWERED QUESTIONS FROM FORUM - 1

Unfinished from TTY Forum-1 - Provide the answers to written questions submitted during forum. This completes open issues from TTY Forum -1
Non -TTY Questions:
1. **Explain 67% accuracy rate.** Location of caller must be known 100% of the time, 67% of the time it must be within the metric for the required area.
2. **GPS vs. Triangularization .** No one technology meets all needs. The market will determine the best location technology to meet the requirement for 125m 67% of the time.
3. **Where can I get a copy of section 255?** Contact Government Printing Office or download from the FCC's website at www.fcc.gov.

4. **LNP related to ANI and ALI?** Does not directly relate to a TTY user. The 9-1-1 call centers call back through the LEC. It is network based and transparent to the caller. Both the ported number and the callback number reside within the database.
5. **Trunk lines are different for wireless and wireline 9-1-1 calls?** The wireless and wireline both come in to the PSAP on the same trunks.
6. **Deaf person calls 9-1-1 and call dropped - what happens?** Normal procedures are used at the PSAP to ask for call back phone number so they can call back.
7. **Deadline (Oct.1) is around the corner - can it be met?** The FCC has imposed a deadline of 12 months (October 1, 1998) rather than the extension of 18 months recommended by the TTY Forum and the "15+3 months" extension recommended by the TTY Consensus Agreement..
8. **Feature group D migration to SS7** - They are not compatible protocols, an upgrade to the interface will be agreed to by CLEC and PSAP.
9. **Cost recovery?** For states and localities that do not have a legislated cost recovery mechanism in place, carriers are considering contractual arrangements/private agreements with the PSAPs to address cost recovery. This issue was raised with the FCC on reconsideration of E9-1-1 Order, but the FCC's News Release re: E9-1-1 Recon Order does not address cost recovery. There is concern that some legislatures are putting caps on cost recovery. Ten to twelve states have adopted legislation as of last session. NENA magazine has reported on State legislature progress in this area. This information is probably on their website as well.
10. **Liability** - Carriers and PSAPs are lobbying state legislatures for indemnification. Carriers are also including indemnification clauses in their contractual arrangements/private agreements with the PSAPs.

TTY related Questions:
1. **Baudot tones used on MOS test?** Likely not used in the test. Is still a topic for discovery. Music is not a varying transmission the way Baudot would be. Vocoder anticipates and predicts next tones. Baudot not predictable, as would non-professional music. Running at full speed the bits in Baudot can be dropped. 300bps works better than Baudot. (MOS stands for Mean Opinion Score, a test of spoken word developed in the early days of wireline telephones.)
2. **What portion of TTY devices powered through RJ11 connection?** Basically network started with acoustic devices and low cost, largest population have both acoustic and RJ11, recent some high end are just rj11
3. **Do digital vocoders work the same?** Answer is that all have different error correction and prediction methods. That is why they all need to be tested and at last meeting recommended to investigate other technologies.

6 & 7. CONSENSUS AGREEMENT AND FCC ORDER OF DECEMBER 1, 1997 - Andrea Williams, CTIA

CONSENSUS AGREEMENT

Signatories: CTIA, PCIA, NAD, TDI, CAN, Gallaudet University

MAJOR PROVISIONS:

- Extension of compliance date (15 months + 3 months extension = 18 months maximum)
- PCIA amends petition
- NAD & CAN withdraw opposition to PCIA petition
- Brief quarterly status reports to FCC
- Consumer Advocacy Groups provide appropriate technical experts to the working groups

FCC INTERIM E9-1-1 ORDER

MAJOR PROVISIONS:

- Adopted & released December 1, 1997
- Interim Order to clarify obligations of wireless carriers until the rules adopted by FCC in the E9-1-1 Reconsideration Order are effective.
- Carriers using analog wireless systems are subject to the TTY compatibility rules effective December 1, 1997
- For carriers using digital wireless systems, enforcement of the TTY requirement is suspended until October 1, 1998

FCC E9-1-1 RECONSIDERATION ORDER

MAJOR PROVISIONS:

- Adopted : Dec 1, 1997 Released: ?
- Carriers using analog wireless systems are subject to the compatibility rules effective December 1, 1997.
- Carriers using digital wireless systems, enforcement of the TTY requirement suspended until October 1, 1998. 12 month extension of initial compliance date.
- Additional requirements: Waiting for release of E9-1-1 Reconsideration Order for specifications.

FCC's E9-1-1Reconsideration Order will be attached to meeting summary if it is released in time for inclusion.

QUESTON RAISED FOR DISCUSSION: What does Oct. 1, 1998 mean?
- commercial availability and extent of availability   OR
- pass the TTY signal over digital systems OR
- field trials

What is the level of technology success available in the field? Discuss lab vs. Field tests.

The proper coupling is the most significant area of problems with the transmission of TTY signals.
Need to explore interim responsibilities, specifically consumer notification of capabilities of wireless to carry TTY.

Comments:
- *FCC is a very reasonable group. They would prefer to see a schedule to show how the industry would be able to accomplish this by the deadline. Understanding that the FCC is looking for an analog and a digital solution.*
- *The group needs to establish a standardized testing method.*
- *Analog system could be down while digital available.*
- *Need to set our goal and lab tests to meet the goal to provide a commercially available product by the Oct. 1, 1998 date. May miss the date but need to work toward that.*
- *The solution will require cooperation between carriers and manufacturers*
- *The coupling is the key to the solution.*
- *Working Group 3 has tried multiple systems and do not know if it works for all cases.*
- *The product development cycle will eat up the R & D time to make a good solution.*
- *No one wants a quick and dirty solution.*

8. EXECUTIVE SUMMARY FOR THE WEIAD-2

The stated purpose of the WEIAD is to prepare an annual status report to the FCC. The FCC mandated that the parties to the E9-1-1 Consensus Agreement, PCIA and TDI be represented in the WEIAD group.
One of the elements to be included in the report is the solution to digital TTY. After two meetings of the WEIAD, it was determined that the WEIAD is the best forum to resolve issues. Strongest Signal and TLDN remained unresolved and were remanded to a technical forum under guidelines that are set by TIA. The first workshop (January 5/6, 1998) will address Strongest Signal, chaired by Jeff Crollick. The TLDN issue, chaired by Terri Brooks, will meet January 6/7, 1998. Recommendations from these two technical workshops will be forwarded to WEIAD-3 on January 7 & 9, 1998 for inclusion in the report to FCC.

12. REPORT OF WORKING GROUP #1 - PERFORMANCE OF TTY SIGNALS OVER VOICE SERVICES

Wesley Howe, Chair

Need two types of tests to perform: Voice and bit-error rate. All need to agree on tests and data and acceptable level of performance.

Two standards here: FCC and test mechanism. What we have to establish is maximum error rate to give acceptable performance and does anything exist that provides that. I don't think we are into comparing technologies.
We have different flavors to establish baseline. We need to see a timeline.
We have to deal with knowns - test pattern and same input sample to give statistically valid results. Consumer groups will get together to give some standard tests of value to the testing.

DEMONSTRATION OF ACCOUSTIC COUPLING - David Fitzpatrick, Ericsson, Christopher Kingdon, Ericsson, Doug Neeley, Ericsson

GSM is the same transmission as PCS1900. We get good digital transmission with that solution. We have difficulty with the digital 800mHz solution.
First demonstration showed an acoustic coupler using an external handset attached to phone. 2.5 mm plug patched directly into back of an adapted TTY set. Both used analog transmission using the AMPS system. Working Group#3 is working on coupling and is not demonstrating analog vs. digital signals. The TTY device was modified. The resistors and capacitors could be on the cable but the connection is not totally simple. The TTY device will have to have design changes to accommodate this solution. Another coupler that provides an RJ11 connection is publicly available but requires external power supply. What is needed is possibly some middleware rather than making changes to all existing TTYs. Portability is a big issue with TTY users so the handset needs to be streamlined.

DEMONSTRATION OF ANALOG AND DIGITAL TTY - Norman Williams, Gallaudet University

This is the result of an informal test. It was just completed yesterday, since we just recently received a phone and phone service. The test was done with a Nokia CDMA phone with service provided by Bell Atlantic. I modified the receiver to use a standard 2.5 mm jack. This is nice because it is very portable and does not require an external box. The resistor value is 56k and 1 mg. I checked the performance of this connector by testing analog transmission first. Most analog calls were very clear; once in awhile there was a little trouble. The testing script was sent through as a

macro (not in conversational, two-way mode). There was also pretty good two-way communication in analog. However, when I tested it in digital mode, there was a lot of garbling of Baudot. Results were much better for ASCII at 300 bps (Bell 103) digital transmission. Again, the problems were not with coupling, as the same coupling was used for analog and digital.

(Hand-out of preliminary results was distributed.)

12. REPORT OF WORKING GROUP #3 - COUPLING

Doug Neeley, Co-chair

Group is in process of answering questions from the TTY group. Demonstration of coupling by Ericsson offered as examples of potential. Shows it can be done.

Connecting the phone via an RJ11 jack is one solution not to overlook since the TTY devices already accommodate the RJ11 without adaptation. Is it better to have a small adapter at an inexpensive cost or a specially devised device that is very expensive? The digital that can operate a modem via RJ11 exists today. It is bulky and expensive. The trade-off is that it is readily available, off-the-shelf. Elegance will not be available in the field in 10 ½ months. All these ideas are not worth anything since the vocoder doesn't work well with the Baudot solution. That leaves the question whether 300 baud is preferable to Baudot.

TTY FORUM - 2 CONSENSUS RECOMMENDATION

Combine Working Group #1 and Working Group #3. Develop new set of deliverables based on the October 1, 1998 deadline. Would a phased approach offering a solution in analog and GSM by October 1, 1998 be acceptable?
Short term solution: solve for backward compatibility.
FCC sees one type of digital when there are three basic types which need to be tested.
Come up with a standard test. A consistent recording that can be used by all technologies to test. One of the most important aspects is the TTY.

FOCUS OF WORKING GROUP #3: Develop a specification for interface using:
- 2.5 mm PLUG
- RJ11
- ACCOUSTIC
- OFF-THE-SHELF
- AUDIO TO VOCODER

- ANALOG - EIA-553, IS-91
- DIGITAL:
  - IS-54 - TDMA 800MHz
  - IS-95 CDMA   800MHz
  - IS-136 TDMA 800MHz
  - PCS-1900
  - J-007 GSM
  - IS-136   UPBANDED
  - IS-95B UPBANDED
  - EFR VOCODER - newest vocoder technology (still not perfect for TTY)
- TWO MAIN TTY UNITS:
  - COMPACT TTY UNIT (EZ? AND ULTRATEC),
  - ULTRACOM 400
  - Remember: the vocoder is a problem. Also, some phones modulate out tones and that feature would have to be turned off.

WORKING GROUP #1: Use interface to work solution in the vocoder. Evaluate Performance
- Acoustic
- RJ11
- 2.5mm plug

WORKING GROUP #2: Deliverable will be written report due October 1998.
- A consumer ready product.

DAY 2 DISCUSSION

What does October 1, 1998 deadline mean to this group?
On or before October 1, 1998, group will submit:
- Consumer ready product ready
- Working plan with timelines, goals, alternative solution, technical review

Remanded to next meeting:
Dual mode approach - analog/digital, if phone cannot make connection on digital then default to analog

OPTIONS
- Extensive, documented technical baseline required

- Best solution may require more time - file request for extension beyond 10/1/98
- Please examine:
    - PCS1900 available by 10/1/98
    - Others available after 10/1/98

ISSUES
- Field test vs. Lab
- standardized testing
- error rate
    - max.
    - typical

REMANDED TO NEXT MEETING
- **Interim responsibility to notify consumers... Judy Harkins (Gallaudet) and Laura Ruby (AT&T Wireless) will work on notification requirements to consumers from now until the problem is resolved.**
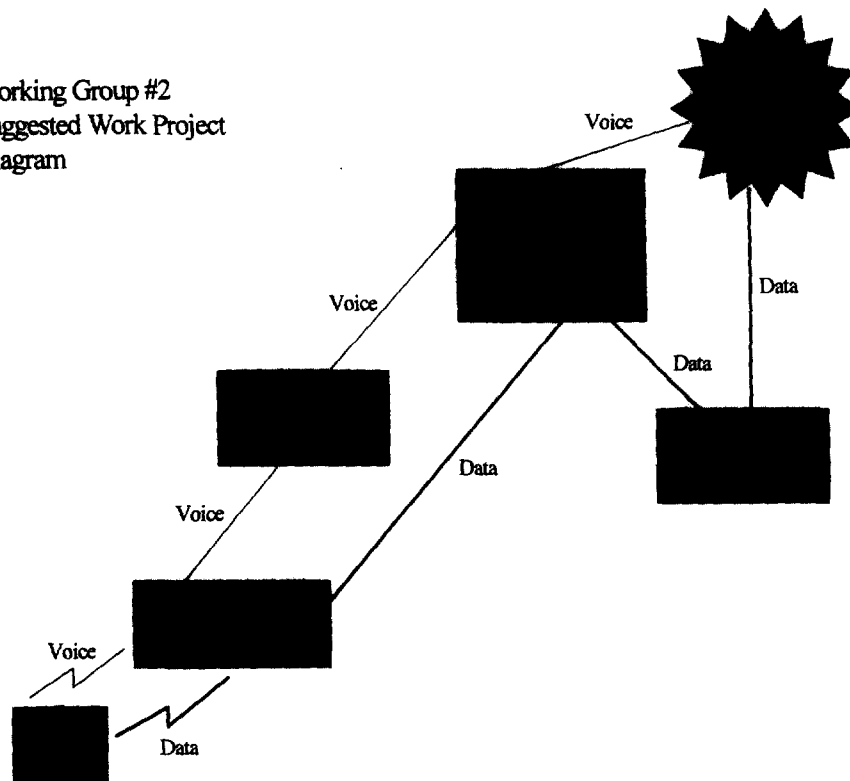
REMANDED TO NEXT MEETING
- **How do we implement solutions?**

12. REPORT OF WORKING GROUP #2

Working Group #2
Suggested Work Project
Diagram

Circuit data completely bypasses the vocoder. Presently signal goes to mobile station, then to the base station, through the transcoder, on to the MSC and MSTN mobile. Digital has a problem because it goes through the transcoder which is designed to receive voice signals.
Another issue is that the TTY device doesn't wait as long as required to make hand shake. The MODEM pool needs to be TTY compatible, use v.18 to make it compatible.

BAUDOT vs. AASCII :
AASCII - high risk of disconnect in transfer or loss of signal
BAUDOT is more robust.

Call in number is the same for both voice and TTY.

A close liaison seen with TIA TR45.1.4 "Vehicle Interface Working Group."
Not all wireless technologies are equal. Digital speech vocoders use several different sampling techniques.

All digital means bypassing the vocoder.

New modems between the caller and the PSAP expected - 3-5 years.
TTY modem pool for that data function - includes 45.45 Baud on the data
channel as well as forward looking options.
Confusion between voice and data in call back is a concern to the deaf
community.
Guidance to group: take Baudot as main focus and explore all alternatives
possible.

CLARIFICATION OF PHONES, SERVICES & STANDARDS, TTY COMPATIBILITY

PHONES AND SERVICES
- **800MHz analog**
- **800 MHz analog +800 MHz IS-136**
- **800 MHz analog +800 MHz CDMA**

- **1900 MHz PCS 1900**
- **1900 MHz PCS 1900 +800 MHz ANALOG**
- **1900 MHz CDMA**
- **1900 MHz CDMA + 800 MHz ANALOG**
- **1900 MHz IS-136 + 800MHz IS-136 +800MHZ analog**

TTY COMPATIBLE

DATE	TECHNOLOGY
Now	800 MHz analog
10/1/98	1900 MHz PCS1900
?	800 and 1900 MHz IS-136
?	800 and 1900 MHz CDMA

ANALOG AND DIGITAL STANDARDS
- **ANALOG**
  - **EIA/TIA-553, IS-91**
- **DIGITAL, 800MHz:**
  - **IS-54 - TDMA 800mHz**
  - **IS-95 CDMA 800mHz**
  - **IS-136 TDMA 800mHz**
- **DIGITAL 1900MHz**
  - **PCS-1900**
  - **J-STD-007 PCS1900 (GSM)**
  - **IS-136 UPBANDED**
  - **IS-95B UPBANDED**

12. REPORT OF NEWLY FORMED WORKING GROUP #1/3

Wesley Howe, Doug Neeley, David Holmes, Co-chairs

Scope:

Utilize existing TTY units with existing wireless phones, transport Baudot data over "voice" channel paths through the wireless vocoder circuitry. This interim combined group shall concentrate on short-term solutions, identify optimal coupling that is readily achievable, to maximize compatibility with existing products.

Recognizing that a single inter-connect may not fit all combinations, evaluate and benchmark possible achievable multiple solutions to achieve working TTY/wireless compatibility.

Establish specification for common 2.5 mm audio path interconnect and present contribution to applicable TIA MS standards organizations (e.g. TIA TR-45.1)

Deliverables:

1.   Preliminary Acoustic-direct coupling. Preliminary Acoustic handset.
2.   Activities:

A)   Recommend specific connection types/levels and specifications (physical and electrical) for connecting existing TTY devices to existing wireless phones.

B)   Develop a standard test for error rate using contribution (below) to assist in developing test pattern.

C)   Develop acceptance test for interactive TTY over wireless

D)   Recommend for other future changes to improve TDD support via wireless.

(Deliver at least one connection type and a standard test for error rate by the end of January, 1998.

-Meet in January

-Seek commitment to apply tests from capable parties.)

3.   Electrical specifications for 2.5 mm audio interface.

Add Consumer thoughts on testing - Judy Harkins to help develop an exact bit stream to represent the requirements of a 9-1-1 call. Recommended to use a typical TDD device and interface and then further test on other equipment.
Coverage for TTY user over the network is the same as for speech.

Check quickly for technologies that will have the potential for success, and eliminate all technologies that cannot meet the deliverable of TTY by October 1, 1998.

Base: Analog generally less than 1% error
*   GSM less than 7%*

Other considerations/deliverables from Working Group #1/3 for next meeting:
Christopher Kingdon, Ericsson, resubmit test from TTY1 using new test pattern.
Other manufacturers will submit test using similar test to Chris's and new test pattern.
Tests will not be applicable for CDMA.
Reach the deliverable within the parameters and with respect for proprietary issues. Be able to identify that tests were acceptable. But establish the benchmark for acceptability. Determine usability rate in the various equipment combinations and be able to increase challenges to determine where level of unacceptability begins.

13. FCC STATUS REPORT: Structure of TTY Section - Ed Hall, CTIA

What needs to be included?
- Four Interest Groups working together
  - working groups - scope and charter
    - seeking short term/long term solutions
- Tutorial on digital telephony and vocoders
  - Various digital air interface may require further study for best solution
  - Various TDD may present various challenges
  - Interface issues may require further analysis
- Attach Forum 1 & 2 Reports

14. TTY FORUM ADMINISTRATIVE ISSUES

- Payment for Interpreters
  - ANSWER: Remand to Steering Group.
- Future Meeting Sites
  - ANSWER: Agreed to Wash/Baltimore area for meeting sites to accommodate Consumer Groups.
  - Consumer Fees
  - ANSWER: Cost recovery fee for meetings was agreed to by Steering Committee because it was not budgeted for by CTIA/PCIA. A lottery or 1:4 subsidy of paid industry seats for 1 free

consumer seat was suggested. The consumer groups need to be represented as a team so the consumer groups can represent their views properly. Remand to Steering Group.
- SHHH/ASHA included at meetings
  - ANSWER: Add them to meeting list. CTIA will take this for action.
- Advanced Agenda Issued
  - ANSWER: No longer a problem - next agenda will be attached to Meeting Report for distribution

15. NEW BUSINESS/NEXT STEPS

Do not lose sight of progress of Working Groups. Next steps will come from them. Deliverables for January critical.

16. NEXT MEETING

FEB 11/12 (as closely as possible) at Gallaudet University or FCC location.

17. CLOSING REMARKS AND ADJOURNMENT

Claude Stout, TDI
The meetings have been good. Progress has been made and commitment has been made on everyone's part. Combining the two working groups will give a lot of impetus to meeting the deliverable.

Art Prest, CTIA
Thank you for your support. Please participate in the working group because some of the chairs may have been left hanging because of non-participation.

Doug Neeley, Ericsson
Thank you to David and Christopher for showing results when not even on a working group. And Norm for bringing data and results on an issue of great concern.

ATTENDANCE

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TTY Forum

Seeking Solutions to TTY/TDD Through Wireless Digital Systems
TTY/TDD FORUM - 3

Draft Report .01
(February 18, 1998)

February 11 - 12, 1998
TTY Forum - 3
Gallaudet Univ.

This report will follow the structure of the agenda (included below) and will make the changes in agenda order agreed to and recorded in the opening remarks section. The agenda number will be used to precisely identify topics and will be offered out of numerical order to reflect the order in which each topic was presented during the forum. Several additional headings were added to accurately reflect the discussion topics added during the forum.

AGENDA

Forum Goal: *Seeking Solutions to TTY/TDD Through Wireless Digital Systems*
9:00 AM

1. Call to Order & Opening Remarks	Co-Chairs, CTIA/PCIA Judy Harkins, Host
2. Introductions and Attendance Roster	
3. Review & Approve TTY Forum - 2 Summary	
4. Review & Approve Agenda	
5. Review TTY Forum 1 and 2 *Agreements*	Steering Committee
6. Introduction & Numbering of Contributions	
7. TTY Forum Administrative Issues	Steering Committee[1]
8. FCC Report and Order 97-402 - Clarification of December 1, 1998 deadline - Reporting Requierments	Mike Altschul, CTIA
9. WEIAD's Status Report to the FCC	Ed Hall
10. Working Groups	
• Working Group #1/3: Performance of TTY Signals over Voice Services and Coupling	Wesley Howe Doug Neeley, Chairs
• Working Group #2: Performance of TTY Signals over Data Services	Brye Bonner, Chair
1 Consumer Notification Strategy	Laura Ruby
2 FCC Status Report: Structure TTY Section	Steering Committee
3 How to Implement Solutions/Proposals	Open Discussion
4 New Business/Next Steps	Co-Chairs
5 Next Meeting	
6 Adjournment	*3:00 PM February 12th*

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[1] TTY Forum Steering Committee: Toni Dunne; Billy Ragsdale; Claude Stout; Norm Williams; Jeff Crollick, John Melcher

Table of Contents

CALL TO ORDER AND OPENING REMARKS

Co-Chairs Mary Madigan, PCIA and Ed Hall, CTIA, call meeting to order. Judy Harkins, Gallaudet University, welcomed group.

INTRODUCTIONS AND ATTENDANCE ROSTER

Introductions made and attendance roster circulated. Recommendation by co-chair to move Agenda item #4 (Review and Approve Agenda) to follow Agenda item #2. Approved.

REVIEW AND APPROVE AGENDA

Recommendation to move Agenda item #11, Consumer Notification Strategy, to follow #8, FCC Report and Order 97-402.
Change approved, Agenda approved as amended.

REVIEW AND APPROVE TTY FORUM - 2 SUMMARY

Comments have been collected and changes made to report. Call for additional comments. No comments presented, chair moved to accept TTY Forum - 2 Summary. Report accepted. Recommendation made to separate the page of "Agreements Reached" from body of the report, making it an on-going page attached to succeeding reports allowing agreements to be added or changed by subsequent meetings. Report will note meeting at which additions and changes were made.

REVIEW TTY 1 AND 2 AGREEMENTS

(Note: An "Agreements" page will be attached as an Appendix to all TTY Forum Reports and will provide an on-going record of agreements reached and changes to existing agreements.)
Verify agreement:
- Short term solution - through vocoder
- Long term solution - possibly excludes sending BAUDOT tones through vocoder

Only the TTY Forum may change agreements reached by this body.
Call for comments. Hearing none, agreements are accepted.

New Additions to Agreements Page (see Appendix A for complete list of TTY Forum Agreements):
- 6 sponsored spots for identified consumer groups, relinquished if member misses 2 consecutive meetings.
- Accept modified "readability test" to be used by phone manufacturers to benchmark TTY over digital capabilities, to determine success rate for transport. (See Contribution TTY/98.02.11.06) Two tests: Manufacturers Readability Test, End User Test
- Error rate is defined as "character" not "bit" for the purpose of this forum. (Shift error rate of ratio 1/8 (i.e. 1 shift error causes up to eight text errors and will be counted as such) to be determined)

- Develop User Requirements Document. The outcome of Working Group #2. Represents the effort to provide for future advancements in technology by looking at solutions beyond 45.45 baud, Baudot.
- Define process to update Notification Document: refer updated information to CTIA to be distributed to T-CAT.

INTRODUCTION AND NUMBERING OF CONTRIBUTIONS

Call for contributions.

Numbering	Name of Contribution	(Agenda Topic #)
TTY/98.02.11.01 - Agenda		(01)
TTY/98.02.11.02 - TTY Forum - 2 Report		(02)
TTY/98.02.11.03 - Proposed Draft Text - TTYs and Wireless Phones		(11)
TTY/98.02.11.04 - Proposed E911 TTY/Digital Notification Strategy		(11)
TTY/98.02.11.05 - Ericsson Contribution		(10)
TTY/98.02.11.06 - Joint Task Force Working Group #1/3		(10)
TTY/98.02.11.07 - Ericsson - E9-1-1,TDD Compatibility to GSM		(10)

TTY/98.02.11.08 - Roster
TTY/98.02.11.09 - FCC E9-1-1 Reconsideration Order FCC 97-402 (Note: Change made to reporting date - July 10, 1998 *not* June 10, 1998 as written)
TTY/98.02.11.10 - Real Life Test Pattern

TTY FORUM ADMINISTRATIVE ISSUES

Steering committee reviewed slots:
1 - SHHH
1 – Gallaudet University
1 - TDI
1 - ASHA
1 - NAD
1 - CAN

Slot assignments approved, contingent on whether ASHA wants their slot. If they do not want slot, their name will be dropped. The Wireless Industry will pay the meeting cost for the attendance of the above six members (five members, if ASHA drops out).

Proposed Rule: If organization does not send a representative for two consecutive meetings, the subsidized slot will be forfeited. The group will not be excluded, just will lose their funding (may petition for reassignment of slot).
Discussion:
- Karen Peltz-Straus, NAD, reported that ASHA may not want their slot, will just want to be informed. Recommends that groups not able to attend will give their proxy to another group and retain slots. Must maintain cognizance with issues.
- Billy Ragsdale, Steering Committee, clarified that the issue with loss of slots is that members who don't attend meetings can be disruptive if they don't keep up with issues. Perhaps the rule could be made less stringent but the issue recognized.

- John Melcher, Steering Committee, recommended that all meetings be held in Washington DC to accommodate needs of consumer organizations and ensure their ability to attend.
- Ed Hall, co-chair, stated that copies of the TTY Forum report are available to all at no cost. Information will be sent to all who request it.

Vote taken, one opposed. Rule is accepted.

FCC REPORT AND ORDER 97-402

Overview of Major Provisions:
- Analog in effect 12/1/97
- Digital enforcement suspended to 10/1/98
- Notification Requirements
- Reporting Requirements
- FCC's Wireless Telecommunications Bureau authority to extend compliance date to January 1, 1999, if necessary. Decision based on quarterly reports.
- Functional equivalents
- Phase I and Phase II E9-1-1 Requirements and Implementation Dates.

What does it mean?
- Commercial availability - Goal is operational by 10/1/98 all digital wireless systems have reliable and compatible TTY so PSAP and TTY user can easily communicate]
- Extent of availability - all digital
- Phased approach - Default to analog of compatible available for one type of digital - focus on having all systems operable

Notification Requirements
- wireless carriers whose systems are not compatible
- reasonable efforts to notify current and potential subscribers
- Message - TTY users will not be able to use TTYs to call 911 with digital
- FCC encourages w carriers to work with a TTY and (4 stakeholders) with respect to notification

Duration: Until compatibility problem solved. Order silent as to objective criteria as to acceptable error/compatibility

Reporting requirements
April 10
July 10
Oct 10
- Purpose of status reports
    - Monitor, encourage, ensure progress of the TTY Forum
    - Condition for suspension of enforcement of TTY requirement
    - Foundation for any future requests to FCC for further extension of compliance date

- Content of Status reports
  - Information regarding the problems associated with TTY access through digital wireless systems
  - proposed technical solutions
  - steps taken to achieve proposed technical solutions'
  - steps taken to notify current and potential subscribers
  - sufficiently detailed to assess progress
- Signatories to consensus agreement responsible for filing quarterly status reports
  - CTIA, PCIA, NAD, Gallaudet, TDI, CAN
  - Recommendation: TTY Forum Reports as basis for quarterly status reports

Functional Equivalents
FCC Determination in E9-1-1 Reconsider Order:
- Digital wireless carriers cannot rely on "functional equivalents" such as short-messaging text or data services compliant with international standards to meet obligations under TTY requirements
- Not appropriate or practical alternative for hearing and speech impaired persons in an emergency
- Such "functional equivalents" currently are little or no benefit to TTY user in an emergency , because few PSAPs are configured to accept short messaging services directly and not all PSAPs can accept ASCII type TTY calls and other types of data calls.

Discussion: In agreements reviewed this morning - refer to short and long term solutions -
Phase I and II requirements
- Phase 1 and 2 including the implementation dates apply to TTY calls, except Phase 1 requirements for TTY calls through digital wireless systems are deferred until 10/1/98
Phase 1 Implementation Date:
Analog Wireless systems April 1, 1998
Digital – October 1, 1998
- Phase 2 Implementation Date : Location for analog and digital wireless systems – October 1, 2001

CONSUMER NOTIFICATION STRATEGY

Summary:
Discussion centered on defining who must be notified, how to reach them, and what the information a Notification Letter should contain. The Notification Strategy Chart (Contribution WEIAD/98.02.11.04), analyzing the type of customer, possible methods of notification, messenger(s), and target delivery

date, was presented. A working group was formed to provide a proposed Notification letter to the group. Notification Letter was discussed day 2 and approved with modifications. Approved Notification Letter is included as Appendix B.

Laura Ruby, AWS, chair, presented the Notification Strategy Report. Message must be consistent to avoid confusing customers. Contribution WEIAD/98.02.11.04 - Notifications Strategy Chart - identifies customer type, possible methods of notification, messengers, target delivery date. Most customers are unaware of TTY and requirements and may have relative or friend who can use information. Most current customers using TTY have been in close communications with carriers/manufacturers. In some situations the carriers need help from manufacturers and consumer groups to reach consumers who are not in contact with service providers. Add the notification message to booths at Trade Shows, etc. TTY manufacturers are a key to the notification by identifying what the device can and cannot do.

Comments:

- Recommendation from CAN: Carriers must provide individual notification to all potential users, including researching to identify all deaf and hard-of-hearing persons, via mail.
- Only those who are potential customers need to be notified, not all people.
- Those making a decision may need information prior to purchase.
- Potential users need to do the research and be supported by their consumer groups
- Industry could notify consumer groups to get notification into their publications and meetings. Consumer groups need to take some responsibility and help wireless industry to ensure notification. There are cost related issues that cannot be discounted and groups need to work together to accomplish goal.
- Cooperation among groups is required to produce widely available notification, i.e. through websites, using the consistent, agreed-to format.
- Offer of help from equipment distributors, who distribute equipment for free.
- Carriers bear the responsibility for notification therefore burden of expense is on carriers to pay for all notification.
- Carriers are looking for wording from TTY Forum.
- Notification work effort is most important work from this meeting. Carriers feel sense of urgency to provide to carriers for immediate implementation.
- Problem with arriving at a consistent message in the next day is that the correct information is not necessarily known at this time.
- Can this group work on the message without having a process to disseminate information?
- Reason for this notification effort is to protect the consumer from making a bad purchase. This group should not expand the FCC requirement beyond what the intent was.
- Consensus on action team to be created to work on wording to report back to group. Request representation from all groups.
- TTY manufacturers are not represented at this meeting - Ameriphone, Krown,